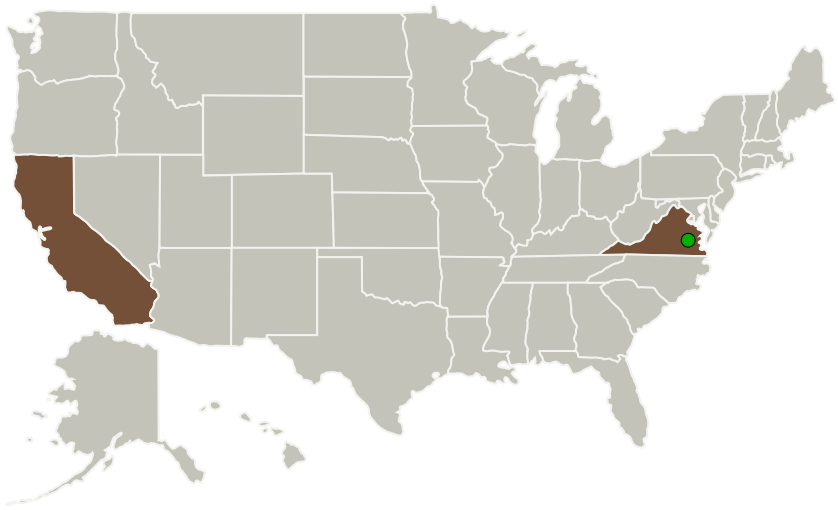
Physics-Based Conceptual Design Tools, Phase I

Completed Technology Project (2014 - 2014)

Project Introduction

In the current proposal, M4 Engineering will develop and evaluate the feasibility of an innovative concept aimed at enhancing previously developed databases with physics-based weight and load estimation relationships (via stochastic response surfaces) for unconventional (and conventional!) conceptual wing and fuselage designs. The main goal for this effort will be to develop a software tool capable of generating weight and load responses for unconventional designs from physics-based simulations. In an effort to minimize risk and expedite development, the proposed software tool will utilize two previously developed in-house robust toolsets for rapidly generating finite element models and constructing stochastic response surfaces.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
M4 Engineering, Inc.	Lead Organization	Industry Women-Owned Small Business (WOSB)	Long Beach, California
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

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Primary U.S. Work Locations	
California	Virginia

Project Transitions

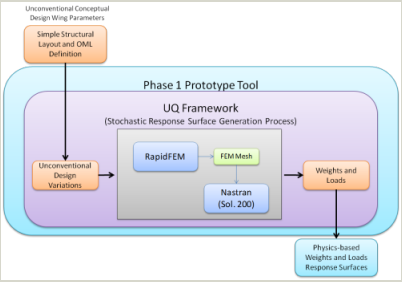
June 2014: Project Start

December 2014: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/141804)*

Images



Briefing Chart
Physics-Based Conceptual Design Tools, Phase I
(https://techport.nasa.gov/image/126694)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
M4 Engineering, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

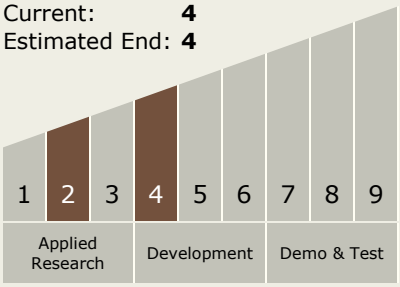
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Tyler Winter

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX15 Flight Vehicle Systems
  - TX15.2 Flight Mechanics
    - TX15.2.4 Modeling and Simulation for Flight